LAW OFFICES
SUGHRUE, MION, ZINN, MACPEAK & SEAS, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
WASHINGTON, D.C. 20037-3202
TELEPHONE (202) 293-7060
FACSIMILE (202) 293-7860

CALIFORNIA OFFICE
1010 EL CAMINO REAL
MENLO PARK, CA 94025
TELEPHONE (650) 325-5800
FACSIMILE (650) 325-6606

March 3, 2000

JAPAN OFFICE
TOEI NISHI SHIMBASHI BLDG. 4F
13-5 NISHI SHIMBASHI 1-CHOME
MINATO-KU, TOKYO 105, JAPAN
TELEPHONE (03) 3503-3760
FACSIMILE (03) 3503-3756

BOX: PATENT APPLICATION
Assistant Commissioner for Patents
Washington, D.C. 20231

Re: Application of **Tatsuro AKABANE, Seiji KAGEYAMA, Katsumi KUMAGAI and Masamitsu SUZUKI**
PRINT SYSTEM AND PRINT SYSTEM CONTROL METHOD
Our Reference: Q58148

Dear Sir:

Attached hereto is the application identified above including the specification, claims, executed Declaration and Power of Attorney, seventeen (17) sheets of drawings, executed Assignment and PTO Form 1595.

The Government filing fee is calculated as follows:

Total Claims	11 - 20 =	0 x $18 =	$ 000.00
Independent Claims	3 - 3 =	0 x $78 =	$ 000.00
Base Filing Fee	($690.00)		$ 690.00
Multiple Dep. Claim Fee	($260.00)		$ 000.00
TOTAL FILING FEE			**$ 690.00**
Recordation of Assignment Fee			$ 40.00
TOTAL U.S. GOVERNMENT FEE			**$ 730.00**

Checks for the statutory filing fee of **$ 690.00** and Assignment recordation fee of **$ 40.00** are attached. You are also directed and authorized to charge or credit any difference or overpayment to Deposit Account No. 19-4880. The Commissioner is hereby authorized to charge any fees under 37 C.F.R. 1.16 and 1.17 and any petitions for extension of time under 37 C.F.R. 1.136 which may be required during the entire pendency of the application to Deposit Account No. 19-4880. A duplicate copy of this transmittal letter is attached.

Priority is claimed from:

Japanese Patent Application	Filing Date
P. Hei. 11-056648	March 4, 1999
P. Hei. 11-358894	December 17, 1999

The priority documents will be submitted at a later date.

Respectfully submitted,
SUGHRUE, MION, ZINN, MACPEAK & SEAS
Attorneys for Applicant(s)

By _____
Darryl Mexic
Registration No. 23,063

DM:clf

PRINT SYSTEM AND PRINT SYSTEM CONTROL METHOD

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to a printer and more particularly to a print system which can provide printouts in various formats such as double-sided print and multipage output to a sheet of paper and again print a stored print job and a control method of the print system.

2. Description of the Related Art

Hitherto, a PDL (page description language) document processed into a format to be output has been prepared by a logical printer driver of a computer and has been sent to a printer. The processed PDL document or dot image has been stored in an archive as a print job and has been printed in the stored format intact.

Hitherto, a printer has been unable to process in a PDL document or dot image and a PDL document processed into a format to be output has been prepared by a logical printer driver of a computer. Thus, the PDL document or dot image stored in an archive has already been processed. It is difficult to restore the processed PDL document or dot image to a standard format; likewise, it is also difficult to restore the processed PDL document or dot image to a different format. Thus, the stored print job can be printed only in the stored format intact, which is a problem.

A problem of placing a large processing burden on a computer also arises.

SUMMARY OF THE INVENTION

It is therefore an object of the invention to provide a print system for enabling the processing burden on a computer to be lightened and a print job stored in an archive to be reprinted with the format or the number of copied changed as many times as necessary for enhancing the user's convenience and the ease-of-use of the print system.

The following print systems and methods are adopted in the present invention.

A first print system according to the invention comprises a computer and a printer connected directly to the computer or indirectly to the computer via a network, characterized in that a logical printer driver makes print instructions of a prepared document, prepares a PDL document and print information from the document, and spools as a print job, that a spool control section transfers the spooled print job to a PDL processing section, which then processes the PDL document in accordance with the print information and transfers the PDL document to an interpreter, which then interprets the PDL document, expands the PDL document into a dot image, and stores the dot image in an output work, and that an output control section sends the dot image to a print engine for printing the document in the specified format from the computer.

A second print system according to the invention is

characterized in that a spool control section stores a print job in an archive, that a computer makes print instruction through a print instruction section, that the print instruction section updates print information of the print job, that an archive control section spools the print job, that a spool control section transfers the spooled print job to a PDL processing section, which then processes the PDL document in accordance with the print information and transfers the PDL document to an interpreter, which then interprets the PDL document, expands the PDL document into a dot image, and stores the dot image in an output work, and that an output control section sends the dot image to a print engine for reprinting the print job stored in the archive in the specified format from the computer.

A third print system according to the invention comprises a computer and a printer connected directly to the computer or indirectly to the computer via a network, characterized in that a logical printer driver makes print instructions of a prepared document, prepares a PDL document and print information from the document, and spools as a print job, that a spool control section transfers the spooled print job to an interpreter, which then interprets the PDL document, expands the PDL document into a dot image, and stores the dot image in an output work, and that an output control section stores the dot image stored in the output work and the print information in an archive as the print job.

A fourth print system according to the invention is characterized in that a computer makes print instruction through a print instruction section, that the print instruction section updates print information of a print job, that an archive control section spools the print job, that a spool control section transfers the spooled print job to a dot image processing section, which then processes dot image in accordance with the print information and stores the dot image in an output work, and that an output control section reprints the print job stored in archive in the specified format from the computer.

A fifth print system according to the invention is characterized in that a computer makes print instruction through a print instruction section, that the print instruction section updates print information of a print job, that an archive control section spools the print job, that a spool control section transfers the spooled print job to a PDL processing section if the print data is PDL and the spooled print job to a dot image processing section if the print data is a dot image, that the PDL processing section processes the PLD in accordance with the print information and stores the PDL in an output work, that the dot image processing section processes the dot image in accordance with the print information and stores the dot image in the output work, and that an output control section sends the dot image to a print engine for reprinting the print job stored in archive in the

specified format from the computer.

A sixth print system according to the invention is characterized in that an archive is provided for storing a pair of PDL document and printer information and a pair of dot image and print information as print job and that the print job stored in the archive is reprinted in the specified format from a computer.

A seventh print system according to the invention is characterized in that a computer calls standard print information of a print job existing in an archive or already registered print information from a print instruction section and changes based on the called information for registering and using a plurality of pieces of print information for one print data piece with another name or by overwriting.

An eighth print system according to the invention is characterized in that a computer selects print information registered in a print job existing in an archive from a print instruction section and reprints the print job in the format of the print information.

A ninth print system according to the invention is characterized in that a computer sends a reprint instruction to an archive control section from a print instruction section, that the archive control section describes the storage location of print data in print information and spools only the print information through a spool control section, and that a dot image processing section or a PDL processing section accesses

the print data whose storage location is described in the print information of the received print job for reprinting the print job in the format of the print information.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a schematic drawing of the whole of a print system of the invention.

FIG. 2 is a detailed block diagram of the print system for processing a PDL.

FIG. 3 is a schematic representation of 2UP.

FIG. 4 is a schematic representation of saddle stitch.

FIG. 5 is a schematic diagram of a method of preparing saddle stitch.

FIG. 6 is a drawing to show the print instruction contents.

FIG. 7 is a drawing to show the PDL contents.

FIG. 8 is a drawing to show the print data contents provided by processing the PDL in FIG. 7 to 2UP.

FIG. 9 is a drawing to show the dot image contents.

FIG. 10 is a drawing to show the print data contents provided by processing the dot image in FIG. 9 to 2UP.

FIG. 11 is a drawing to show the configuration of a print job.

FIG. 12 is a detailed block diagram of a print system for processing a dot image.

FIG. 13 is a detailed block diagram of a print system

for processing a PDL and a dot image.

FIG. 14 is a drawing to show the detailed print instruction contents.

FIG. 15 is a drawing to show a general format of a document registered in an archive.

FIG. 16 is a drawing to show a state in which print information is added to the document in FIG. 15.

FIG. 17 is a drawing to show a data flow for moving only print information to a spool for reprinting.

FIG. 18 is a drawing to show an instruction screen for reprinting the document in the archive.

FIG. 19 is a drawing to show a screen produced by selecting standard print information on the instruction screen in FIG. 18.

FIG. 20 is a drawing to show a detailed instruction screen displayed resulting from selecting a detail button on the instruction screen in FIG. 18.

FIG. 21 is a drawing to show a state in which setting is changed on the detailed instruction screen in FIG. 20.

FIG. 22 is a drawing to show a screen for specifying page assignment as the next screen to the detailed setting in FIG. 21.

FIG. 23 is a drawing to show a state in which a new print information name is entered to register setup print information.

FIG. 24 is a drawing to show a state in which the print

information name registered in FIG. 23 is displayed as selectable print information.

FIG. 25 is a drawing to show a print information selection screen.

FIG. 26 is a drawing to show the detailed print instruction contents of standard print information.

DETAILED DESCRIPTION OF THE PRESENT INVENTION

Embodiments of the present invention will be described in detail with reference to the accompanying drawings.

First, the general configuration of a print system of the invention will be discussed with reference to FIG. 1.

The print system of the invention comprises a network 400, a second computer 320 and a printer 100 connected to the network 400, and a first computer 310 connected to the printer 100. The printer 100 comprises a printer controller 200 for controlling the printer 100 and a printer engine 500 for performing a printing. The computers 310 and 320 have the same function although the first computer 310 is connected to the printer 100 and the second computer 320 is connected to the network 400. Therefore, the first computer 310 and the second computer 320 will be hereinafter described as a computer 300 as in FIGS. 2, 12 and 13.

A first embodiment of the invention will be discussed in detail.

First, the configuration of the computer 300 will be

discussed with FIG. 2. The computer 300 comprises a print instruction section 303, an application 301, and a logical printer driver 302. To print a document prepared in the application 301, the logical printer driver 302 is used for instruction.

The instruction contents will be discussed in detail with FIG. 6. The instruction contents include a print mode 800, a storage format 820, the number of copies 820, a paper size 830, a paper feed section 840, a paper discharge section 850, an output format 860, a double-sided print 870, a binding position 880, and a staple 890. The print mode 800 is further classified into print 801 and storage 802. The print 801 specifies whether or not a print job transmitted to the printer 100 is to be printed on a paper. The print job represents data required for being printed by the printer. The storage 802 specifies whether or not a print job transmitted to the printer 100 is to be stored in the printer 100. The storage format 810 is classified into a PDL (page description language) 811 and a dot image 811. The PDL 811 specifies whether or not a PDL document is to be stored. The dot image 812 specifies whether or not a dot image which is a format capable of being output to the printer engine is to be stored. The number of copies 820 sets the number of print copies. The paper size 830 sets the paper used for the printing. The paper feed section 840 specifies which of paper storage units to store papers to be printed in the printer 100 is to be used. The

paper discharge section 850 specifies which of printed paper storage units to store the printed paper in the printer 100 is to be used. The output format 860 is classified into standard 861, 2UP 862, 4UP 863, and saddle stitch 864. The standard 861 will be discussed with FIG. 3. It is a standard output format for outputting drawing 620 of one page of a PDL document to paper 610. The 2UP 862 will also be discussed with FIG. 3. Normally, drawing 620 of one page of a PDL document is output to a paper 610 and drawing 621 of one page of a PDL document is output to a paper 611. To save papers, etc., drawing 640 of one page of a PDL document and drawing 641 of one page of a PDL document are output in a reduced scale so as to be fitted into a paper 630. This format is the 2UP 862. The 4UP 863 is a format for outputting four pages of a PDL document to one side of one sheet of paper by a similar method to that of the 2UP 862. The saddle stitch 864 will be discussed with FIGS. 4 and 5. In the description, the document is assumed to be an eight-page document having eight pages for easy understanding, but the eight-page document is not an essential condition. In the standard printing, a drawing 720 of one page of a PDL document is output to a paper 710 in FIG. 5. A similar manner is applied to the second and later pages. In the saddle stitch 864, the eighth page and the first page are output to a rear side 730A of paper 730, as shown in FIG. 5. Likewise, the second page and the seventh page are output to a front side 730B of the paper 730, the sixth page and the third page are

output to a rear side 731A of paper 731, and the fourth page and the fifth page are output to a front side 731B of the paper 731. Next, as shown in FIG. 4, the paper 730 and the paper 731 are put on each other and bound at center parts, for example, like a binding 770 and a binding 771. Next, the paper is folded in two at the center of the paper, for example, like a fold 760. Resultantly, a book is prepared. Such printing is the saddle stitch 864. The double-sided print 870 specifies whether or not double-sided print is to be executed. The binding position 880 sets the binding position if the double-sided print is executed. If left to right is selected, drawing orientations on the front and rear sides become the same. If top to bottom is selected, the drawing orientation on the rear side becomes upside-down. The staple 890 sets the staple position.

The logical printer driver converts data of the application into a print job 1300 shown in FIG. 11 and stores the print job 1300 in a spool 204. The print job 1300 comprises print information 1320 recording the print instruction contents and print data 1310 of the PDL recording the drawing contents. When the print job 1300 is stored in the spool 204, a spool control section 203 interprets the print information 1320. First, the print information 1320 is checked on the print mode 800. If the storage 802 is not set to store the print job in the printer 100(Setting contents = No), no operation is performed. If the storage 802 is set to store the print job

in the printer 100(Setting contents = Yes), the storage format 810 is checked. If the PDL 811 is not set to store the PDL document(Setting contents = No), no operation is performed. If the PDL 802 is set to store the PDL document(Setting contents = Yes), the print job 1300 is copied into an archive 202 and is stored therein. Next, the print 801 is checked. If the print 801 is not set to print the print job onto the sheet(Setting contents = No), no operation is performed. If print 801 is set to print the print job onto the sheet(Setting contents = Yes), the print job 1300 is sent to a PDL processing section 206, which then processes the print job 1310 in accordance with the output format 860 in the print information 1320. Here, as a processing example, processing of 2UP will be discussed with FIGS. 7 and 8. First, the format of the print data 1310 of the PDL will be discussed. The print data 1310 is in a general PDL format as shown in FIG. 7. The print data 1310 begins with a header 910. Generally, a print execution user name, application name, and the like are described in the header 910. The header 910 is followed by data concerning page 1 (920) to page N (950). The data concerning each page is similar and the page 1 (920) is used to describe the format. The page 1 (920) comprises drawing data 921 describing drawing on the page 1 in a programming language and an output instruction 922 indicating the end of the page 1 (920). If the page 1 (920) does not contain the output instruction 922, it is not output even if the drawing data 921 is executed. FIG.

8 shows the print data 1310 in FIG. 7 processed to the 2UP. Since an output instruction 1022 is deleted, drawing data 1021 is not output and subsequently drawing data 1031 on page 2 (1030) is executed. Since the page 2 (1030) contains an output instruction 1032, here the drawing data 1021 on page 1 (1020) and the drawing data 1031 on the page 2 (1030) are output together. Likewise, the subsequent data is output for two pages at a time upto page N (1050).

The print job 1300 thus processed is sent to an interpreter section 207, which then expands the print job 1300 into a dot image of a format that can be output to a print engine 500, and stores the dot image in an output work 209. When the dot image is stored in the output work 209, the output control section 208 outputs the dot image output to the print engine 500. Hitherto, the logical printer driver 302 has processed the print data 1310, thus a large processing burden has been placed on the computer, taking time until the release of the print processing. According to the invention, the print data 1310 is processed in the printer 100, thus the processing burden on the computer 300 is lightened and the print processing time is shortened.

Next, a method of again printing the print job 1300 stored in the archive 202 will be discussed.

To again print the print job, the print instruction section 303 is used for instruction. The instruction contents are the same as those previously described with reference to

FIG. 5. The print information 1320 of the print job 1300 stored by the archive control section 201 is overwritten with the instruction contents and the print job 1300 containing the instruction contents is stored in the spool 204. The stored print job 1300 is processed in a similar manner to that as the print job is stored from the logical printer driver 302 described above. Thus, needs for outputting in various formats in response to the application in the print system are high and the PDL needs to be processed. However, the PDL is provided for outputting one page to one sheet of paper and is not intended for outputting more than one page to one sheet of paper. Thus, it is extremely difficult to restore the format processed so as to describe two or more pages into the original format or a different format. Hitherto, the logical printer driver has processed print data, thus stored print data has already been processed and unable to be again printed in a different format and has been again printed only in the stored format. To print the print data in a different format, it has been necessary to again output the print data from the beginning from application. In the invention, the print job prepared by the logical printer driver is separated into print data and print information and standard print data is prepared. To store the print job, the standard print job is stored as the original and when the print job is actually printed, the print data is processed in accordance with the print information, whereby the print job can be reprinted in the format responsive to the

application as many times as required.

A second embodiment of the invention will be discussed in detail with reference to FIG. 12.

As shown in FIG. 12, a print job 1300 prepared by a logical printer driver 302 is stored in a spool 204 and is sent to an interpreter section 207, as previously described in the first embodiment. The print data of the sent print job 1300 is converted into a dot image and print data 1310 is overwritten with the print data in the dot image, then the print data in the dot image is stored in an output work 209. An output control section 208 interprets print information 1320. First, the print information 1320 is checked on a print mode 800. If the storage 802 is not set to store the print job in the printer(Setting contents = No), no operation is performed. If the storage 802 is set to store the print job in the printer(Setting contents = Yes), a storage format 810 is checked. If the dot image 812 is not set to store the dot image(Setting contents = No), no operation is performed. If the dot image 812 is set to store the dot image(Setting contents = Yes), the print job 1300 is copied into an archive 202 and is stored therein. Next, the print 801 is checked. If the print 801 is not set to print the print job onto the sheet(Setting contents = No), no operation is performed. If the print 801 is set to print the print job onto the sheet(Setting contents = Yes), the print job 1300 is sent to a dot image processing section 205, which then processes the

print job 1310 in accordance with an output format 860 in the print information 1320. Here, as a processing example, processing of the 2UP will be discussed with FIGS. 9 and 10. First, the format of the print data 1310 of dot image will be discussed. The print data 1310 is in a general dot image format as shown in FIG. 9. The print data 1310 begins with a header 1110. Generally, a print execution user name, application name, and the like are described in the header 1110. The header 1110 is followed by data concerning page 1 (1120) to page N (1150). The data concerning each page is similar and the page 1 (1120) is used to describe the format. The page 1 (1120) consists of page 1 drawing data 1122 describing drawing on the page 1 in a binary format and page 1 drawing data size 1121 indicating the size of the data. FIG. 10 shows the print data 1310 in FIG. 9 processed to the 2UP. New page 1 (1220) comprises a listing of the page 1 (1120) and page 2 (1130). New page 1 drawing data size indicates the total size of the page 1 drawing data size 1121 and page 2 drawing data size 1131, and new page 1 drawing data 1222 is provided by combining the page 1 drawing data 1122 and page 2 drawing data 1132. Likewise, the subsequent data is arranged for two pages at a time to new page N/2 (1150). The print job 1300 containing the print data 1310 thus processed is sent to the output work 209. The output control section 208 outputs the print data 1310 to a print engine 500 in accordance with the print information 1320. Thus, needs for outputting in various formats in response to the

application in the print system are high and the dot image needs to be processed. However, it is extremely difficult to restore the combined and processed dot image to the original or convert the combined and processed dot image into a different format. Hitherto, stored print data has already been processed and unable to be again printed in a different format and has been again printed only in the stored format. To print the print data in a different format, it has been necessary to again output the print data from the beginning from application. In the invention, to store the print job, the standard print job is stored as the original and when the print job is actually printed, the print data is processed in accordance with the print information, whereby the print job can be reprinted in the format responsive to the application as many times as required. The dot image is in the format in which it can be output to the printer engine intact, and the dot image is stored in the format, thus making it possible to print the dot image at high speed.

A third embodiment of the invention will be discussed in detail.

As shown in FIG. 13, a print system of the third embodiment has both the PDL processing section 206 described in the first embodiment and the dot image processing section 205 described in the second embodiment and can store either or both of PDL and dot image in an archive 202. Generally, the PDL has the advantage that if data in the PDL is enlarged or reduced, image

quality degradation is small, etc., but has the disadvantage that data in the PDL is converted into a dot image by an interpreter 207 and thus the print time is prolonged, etc. The dot image has the advantage that the dot image is in the format in which it can be output to a printer engine intact and thus the print time is short, etc., but has the disadvantage that if the size is change, image quality degradation is large, etc. In the invention, full advantages of both the PDL and the dot image are taken; if the PDL is used, reprinting can be executed with high priority given to the image quality and if the dot image is used, reprinting can be executed at high speed.

A fourth embodiment of the invention will be discussed in detail.

First, the reprinting procedure described in the first embodiment, the second embodiment, the third embodiment will be discussed using an example. As shown in FIG. 15, Document1 (1610) is stored in an archive 202 as a job. Reprinting instructions from a computer 300 to a printer controller 200 are given using instruction screens shown in FIGS. 18, 20, 22, and 25, for example. First, a document to be reprinted is selected. FIG. 25 shows an instruction screen for selecting a document in the archive. Directories Dir11 (2111) and Dir12 (2112) exist under a directory Dir1 (2110). Further, files Document1 (2120), Document2 (2121), and Document3 (2122) exist under the directory Dir11 (2111). Here, for example, the Document1 (2120) is selected. The file Document1 (2120) is

Document1 (1610) in FIG. 16. Next, reprinting instruction or setting change is executed. FIG. 18 shows an instruction screen for reprinting a document in the archive. The selected Document1 (1610) is displayed in a document name 1700. A print information name 1710 lists print information that the Document1 (1610) has for selection. Number of copies 1720 enables the user to enter the number of print copies. Like the print job 1300 shown in FIG. 11, the Document1 (1610) consists of print data 1611 and added print information 1612 added when it is spooled. The added print information 1612 describes information in the format specified when the print job is spooled. To print the document intact without changing the format, the added print information 1612 may be selected, whereby the added print information 1612 is selected as the print information of the print job spooled at the reprinting time and the document can be printed in the format. To change a part of the contents of the added print information 1612, if the added print information 1612 is selected and a detail button 1711 is selected, the contents of the added print information 1612 can be changed for printing the document. FIG. 21 shows an example of a detailed setting instruction screen of the added print information 1612. If setting is changed and an OK button 3200 is selected, the screen display returns to the instruction screen in FIG. 18. If an OK button 1740 in FIG. 18 is pressed, the document can be printed based on the contents of changing the added print information 1612.

Next, a method of printing the Document1 (1610) in a format different from that at the spooling time will be discussed. Standard print information 1620 used as a model for preparing print information is stored in the archive 202. The print information of the Document1 (1610) is the added print information 1612 only. However, in the print information name field of the print information name 1710 in FIG. 18, in addition to "added print information," "standard print information" is also displayed as shown in the print information name field of print information name 3310 in FIG. 19. The standard print information is print information based on automatic selection or none, such as automatic selection for paper thickness 1810, automatic selection also for paper feed section 1820, and none for spool 1870, as shown in FIG. 20. For printing in a fully automatic format or with some change in the fully automatic format without printing in a special mode, "standard print information" is selected. Next, a method of registering changed print information will be discussed. To change added print information or standard print information, setting change can also be registered as print information, as required. If an OK button 1900 on an instruction screen in FIG. 22 with change made as mentioned above is pressed, a print information registration screen, for example, as shown in FIG. 23 is displayed. A print information name is entered in a new print information name 2010 and an OK button 2020 is pressed, whereby the entered print information name is displayed in a print

information name 3410 shown in FIG. 24. The "standard print information" is thus used as a setting model, whereby it is made possible to save print information setting time and trouble. More than one frequently used print setting is registered, whereby it is made possible to reprint with dispatch.

Next, a fifth embodiment of the invention will be discussed in detail.

First, the reprinting procedure described in the first embodiment, the second embodiment, the third embodiment, the fourth embodiment will be discussed using an example. FIG. 17 is a state diagram to show storing of Document1 (1610) in an archive 202 as a print job. The Document1 (1610) is made up of print data 1611 and added print information 1612 and print information 1 (1613) as print information. When a reprinting instruction of the Document1 (1610) is given from a computer 300, a spool control section 203 moves print information to a spool 204. For example, if "print information 1" is selected in a print information name 3410 on an instruction screen in FIG. 24, the contents of the print information 1 (1613) are, for example, as shown in FIG. 26. A dot image processing section 205 or a PDL processing section 206 interprets the print information 1 (1613) and processes print data in the storage location indicated in a print data storage location 3140. Thus, the spooled print job contents are print information only and print data of a comparatively large data size is accessed after

the location of the print data is found from the print information, whereby it is made possible to reduce the copy time and the hard disk capacity.

When a print instruction is given with various instructions, it is made possible to lighten the processing burden on the computer and shorten the print processing time required for the computer.

A print job is stored in the archive, whereby it is made possible to reprint the print job in the format responsive to the application as many times as required.

WHAT IS CLAIMED IS:

1. A print system comprising:

a computer; and

a printer connected directly to the computer or indirectly to the computer via a network,

wherein the computer comprises a logical printer driver for making print instructions of a document prepared, preparing a PDL document and print information from the document, and spooling as a print job, and

wherein the printer comprises:

a spool control section for receiving the print job spooled;

a PDL processing section for processing the PDL document in accordance with the print information of the print job;

an interpreter for interpreting the PDL document and expanding the PDL document into a dot image;

an output work for storing the dot image;

an output control section for controlling the output work; and

a printer engine for printing the dot image transmitted from the output control section;

wherein the document is printed in a format specified by the computer.

2. The print system as claimed in claim 1 wherein the computer further includes a print instruction section for

updating the print information of the print job and making print instructions, and

wherein the printer further includes:

an archive for storing the print job from the spool control section; and

an archive control section for spooling the print job from the print instruction section.

3. The print system as claimed in claim 1 further including an archive for storing a pair of PDL document and printer information and a pair of dot image and print information as the print job.

4. A print system comprising:

a computer; and

a printer connected directly to the computer or indirectly to the computer via a network,

wherein the computer comprises:

a logical printer driver for making print instructions of a prepared document, preparing a PDL document and print information from the document, and spooling as a print job, and

wherein the printer comprises:

a spool control section for receiving the print job spooled;

an archive for storing the print job.

an interpreter for interpreting the PDL document in the print job and expanding the PDL document into a dot image;

an output work for storing the dot image; and

an output control section for controlling to store the dot image stored in the output work and the print information in the archive as the print job.

5. The print system as claimed in claim 4, wherein the computer further includes a print instruction section for updating the print information of the print job and making print instructions, and

wherein the printer further includes:

an archive control section for spooling the print job from the print instruction section; and

a dot image processing section for processing to a dot image in accordance with the print information,

wherein the archive stores the print job transmitted from the spool control section.

6. The print system as claimed in claim 4 wherein the archive stores a pair of PDL document and printer information and a pair of dot image and print information as the print job.

7. A print system comprising:

a computer; and

a printer connected directly to the computer or

indirectly to the computer via a network,

wherein the computer comprises:

a logical printer driver for making print instructions of a prepared document, preparing a PDL document and print information from the document, and spooling as a print job,

wherein the printer comprises:

a spool control section for receiving the print job spooled;

a PDL processing section for processing the PDL document of the print job;

an interpreter for interpreting the PDL document and expanding the PDL document into a dot image;

a dot image processing section for processing the dot image;

an output work for storing the dot image;

an output control section for controlling the output work; and

an archive for storing the print job.

8. The print system as claimed in claim 7 wherein the archive stores a pair of PDL document and printer information and a pair of dot image and print information as the print job.

9. A method of controlling the print system as claimed in claim 2, the method comprising the steps of:

adding change to a print job stored in the archive based

on one of standard print information existing in the archive and already registered print information; and

newly registering a plurality of pieces of print information with another name or by overwriting.

10. The method as claimed in claim 9, further comprising the step of:

reprinting the print job stored in the archive in the format of the print information selected from the computer.

11. A method of controlling the print system as claimed in claim 9, the method further comprising the steps of:

describing a storage location of the print data in print information without the printed data contained in the print job spooled when the print job stored in the archive is reprinted; and

accessing the storage location of the print data described in the print information by the dot image processing section or the PDL processing section receiving the print job.

ABSTRACT OF THE DISCLOSURE

In a print system comprising a computer and a printer connected to the computer, a logical printer driver makes print instructions of a prepared document, prepares a PDL document and print information from the document, and spools as a print job, a spool control section transfers the spooled print job to a PDL processing section, which then processes the PDL document in accordance with the print information and transfers the PDL document to an interpreter, which then interprets the PDL document, expands the PDL document into a dot image, and stores the dot image in an output work, and an output control section sends the dot image to a print engine for printing the document in the specified format from the computer.

FIG. 1

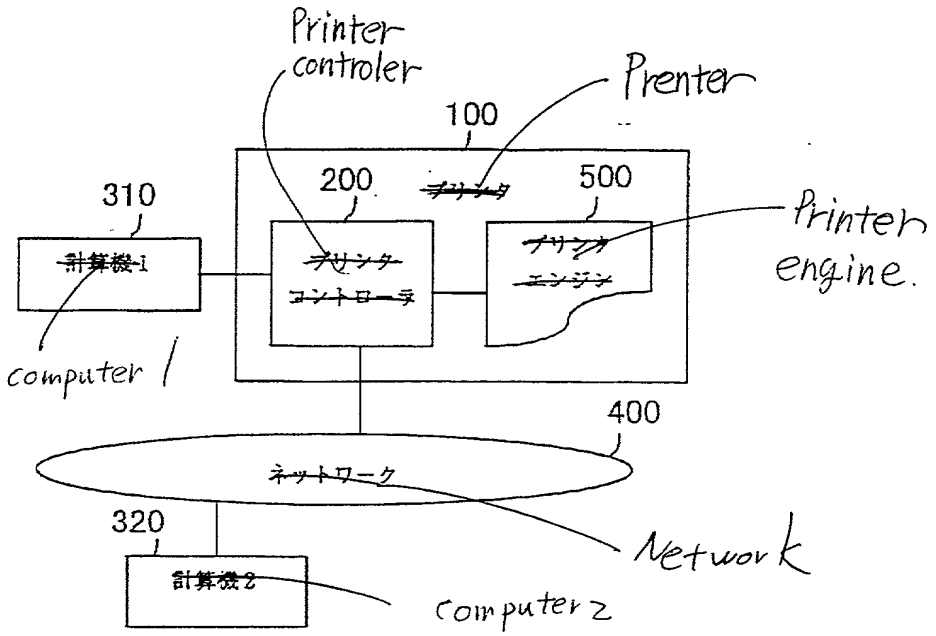

Printer controler
Prenter
100
200
500
310
計算機1
プリンタ コントローラ
プリンタ エンジン
Printer engine.
computer 1
400
ネットワーク
Network
320
計算機2
computer 2

FIG. 2

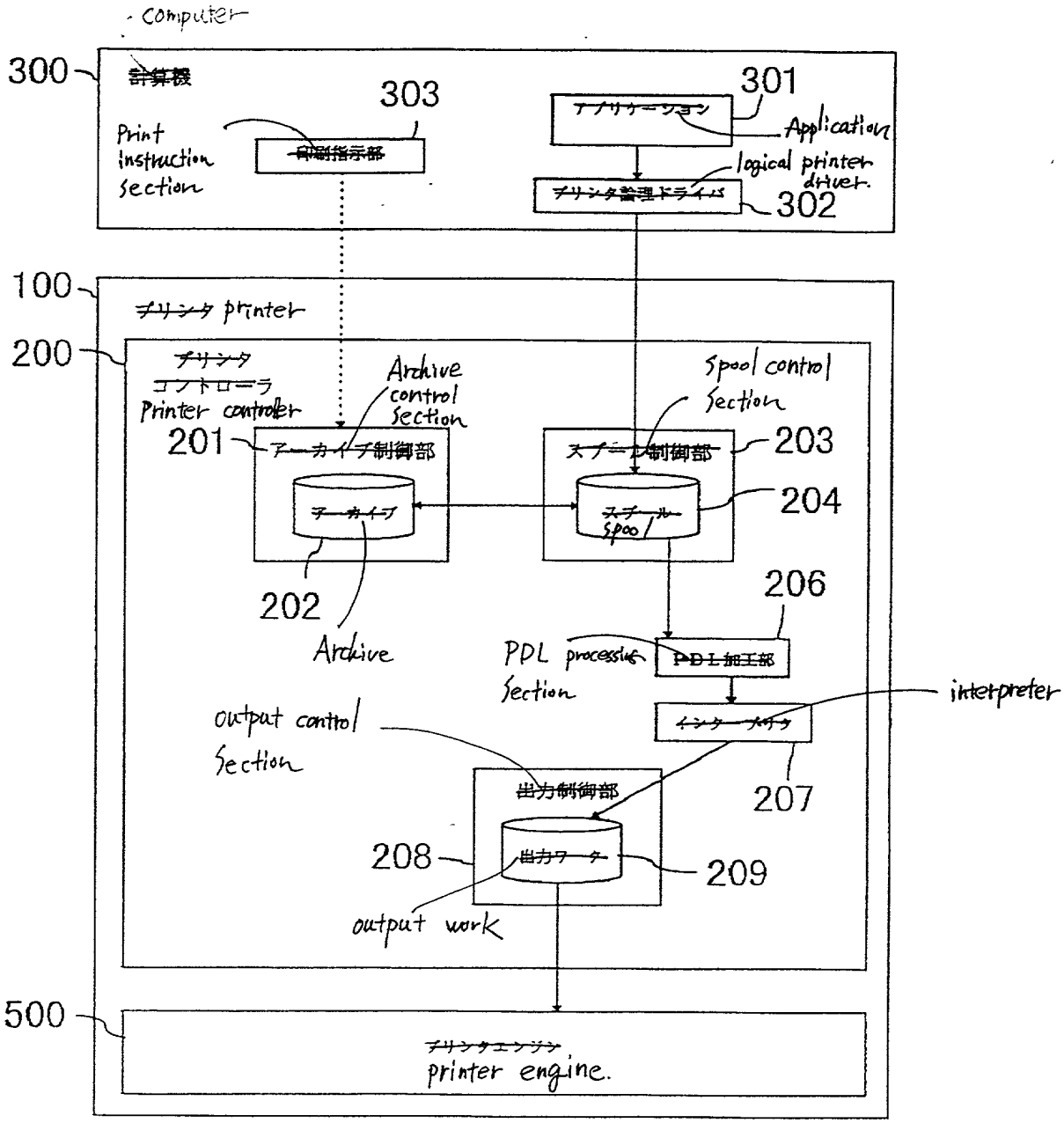

computer
300
計算機
303
Print instruction section
印刷指示部
301
アプリケーション
Application
logical printer driver.
プリンタ論理ドライバ
302
100
プリンタ printer
200
プリンタ コントローラ Printer controller
Archive control Section
201
アーカイブ制御部
アーカイブ
Spool control Section
スプール制御部
203
スプール Spool
204
202
Archive
206
PDL processing Section
PDL加工部
interpreter
インタープリタ
output control Section
出力制御部
207
208
出力ワーク
output work
209
500
プリンタエンジン
printer engine.

FIG. 3

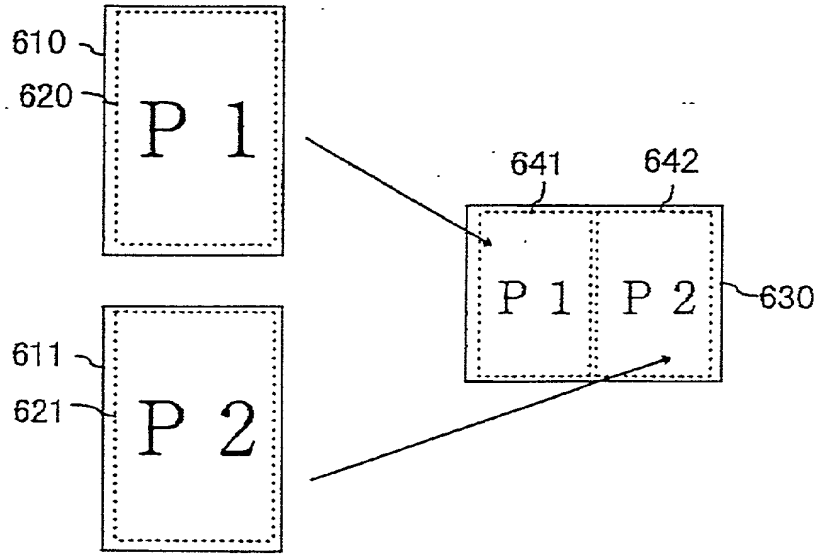

610
620
P 1
641
642
P 1
P 2
630
611
621
P 2

FIG. 4

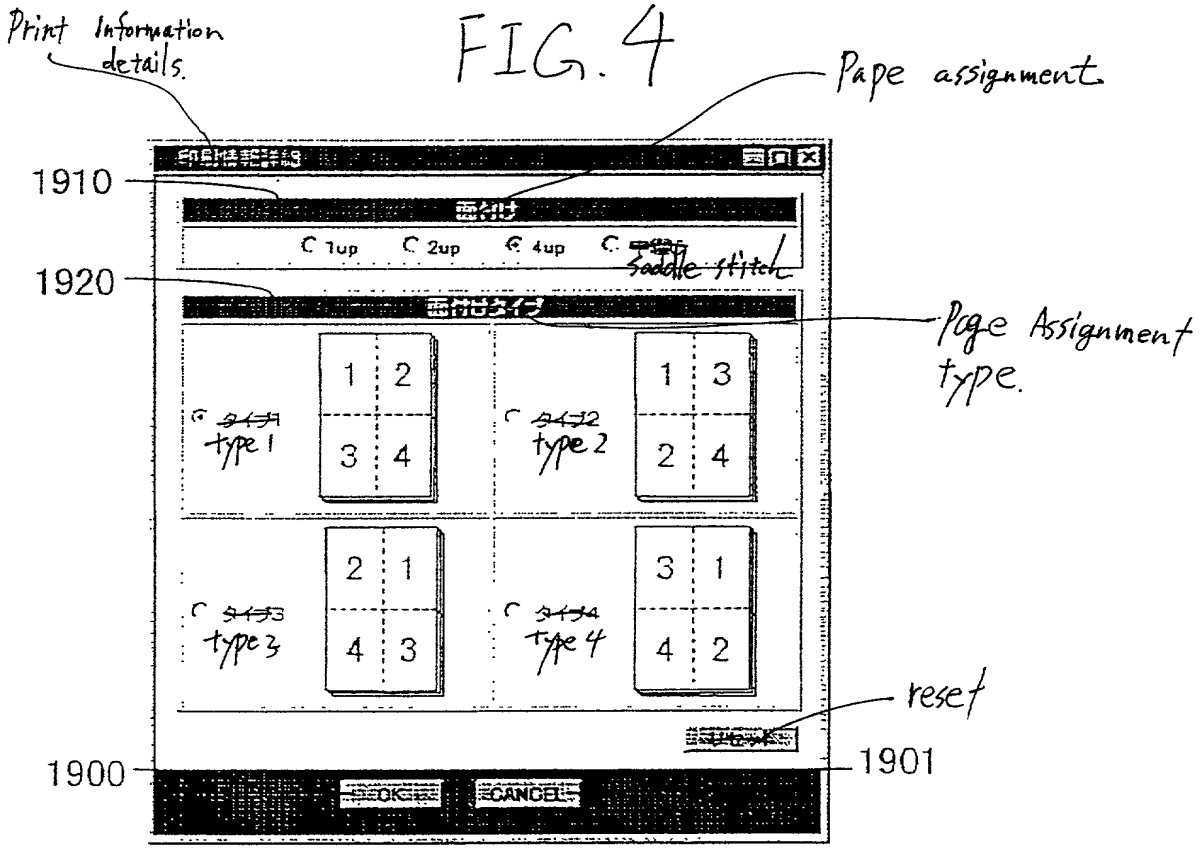

Print Information details.
Pape assignment
1910
1920
1 up
2 up
4 up
Saddle stitch
Page Assignment type.
type 1
type 2
type 3
type 4
reset
1900
1901
OK
CANCEL

FIG. 5

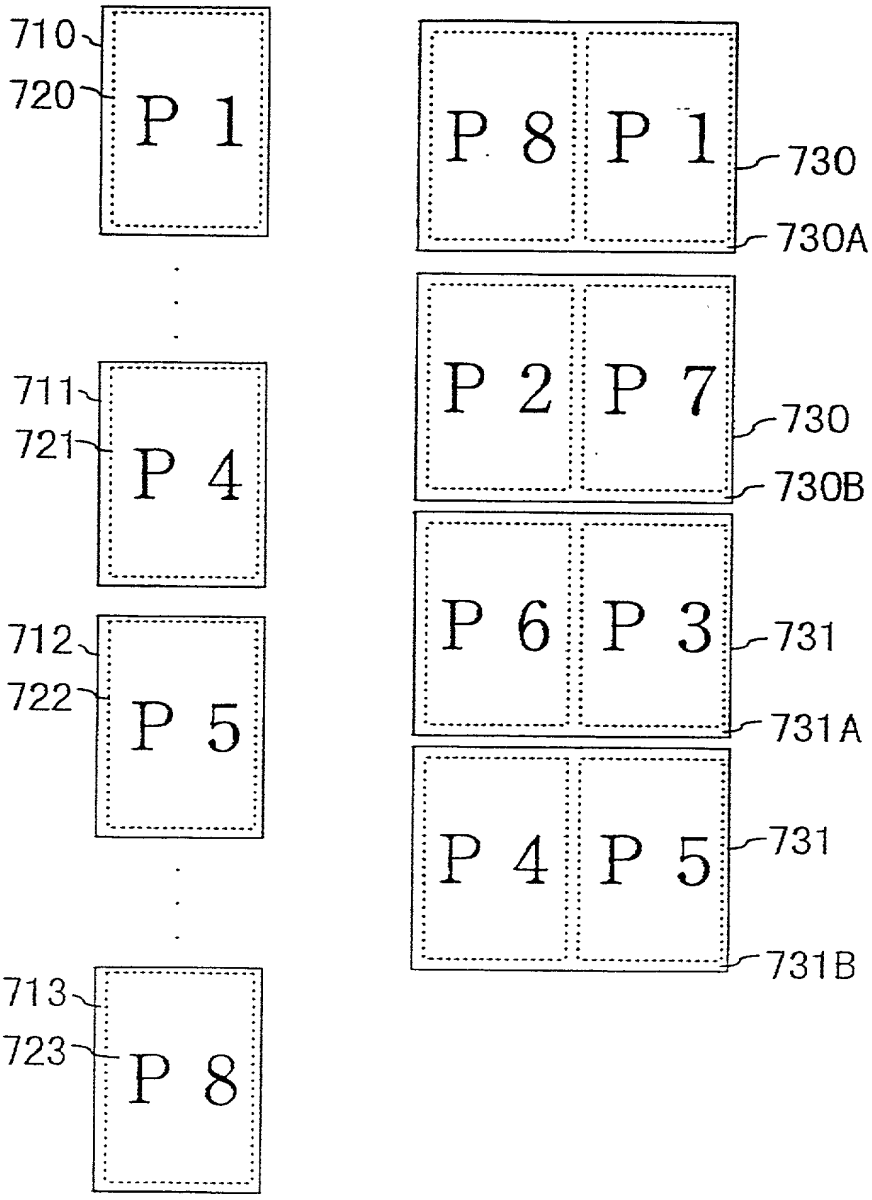

710
720
P 1
711
721
P 4
712
722
P 5
713
723
P 8
P 8
P 1
730
730A
P 2
P 7
730
730B
P 6
P 3
731
731A
P 4
P 5
731
731B

FIG. 6

Item		Setting		Setting Example	
		Contents	Value	Contents	Value
Print Mode (801)	Print (800)	No	0	Yes	ModeP=1
		Yes	1		
	Storage (802)	No	0	Yes	ModeA=1
		Yes	1		
Storage Format (810)	PDL (811)	No	0	Yes	ArchiveP=1
		Yes	1		
	Dot Image (812)	No	0	Yes	ArchiveD=1
		Yes	1		
Number of Copies (820)			Integer	1 copy	Copy=1
Paper Size (830)		A4	0	A3	Paper Size =1
		A3	1		
		B5	2		
		B4	3		
Paper Feed Section (840)		Paper Feed Section 1	0	Paper Feed Section 1	Input=0
		Paper Feed Section 2	1		
Paper Discharge Section (850)		Paper Discharge Section 1	0	Paper Discharge Section 1	Output=0
		Paper Discharge Section 2	1		
Output Format (860)		Standard (861)	0	2UP	Type=1
		2UP (862)	1		
		4UP	2		
		Saddle Stitch (863)	3		
Double-side Print (870)		No (869)	0	Yes	Duplex=1
		Yes	1		
Binding Position (880)		Left to Right	0	Left to Right	Tumble=1
		Up to Bottom	1		
Staple (890)		None	0	Upper-left Corner	Staple=1
		Upper-left Corner	1		
		Two-center Parts	2		
		Upper-right Corner	3		

FIG. 7

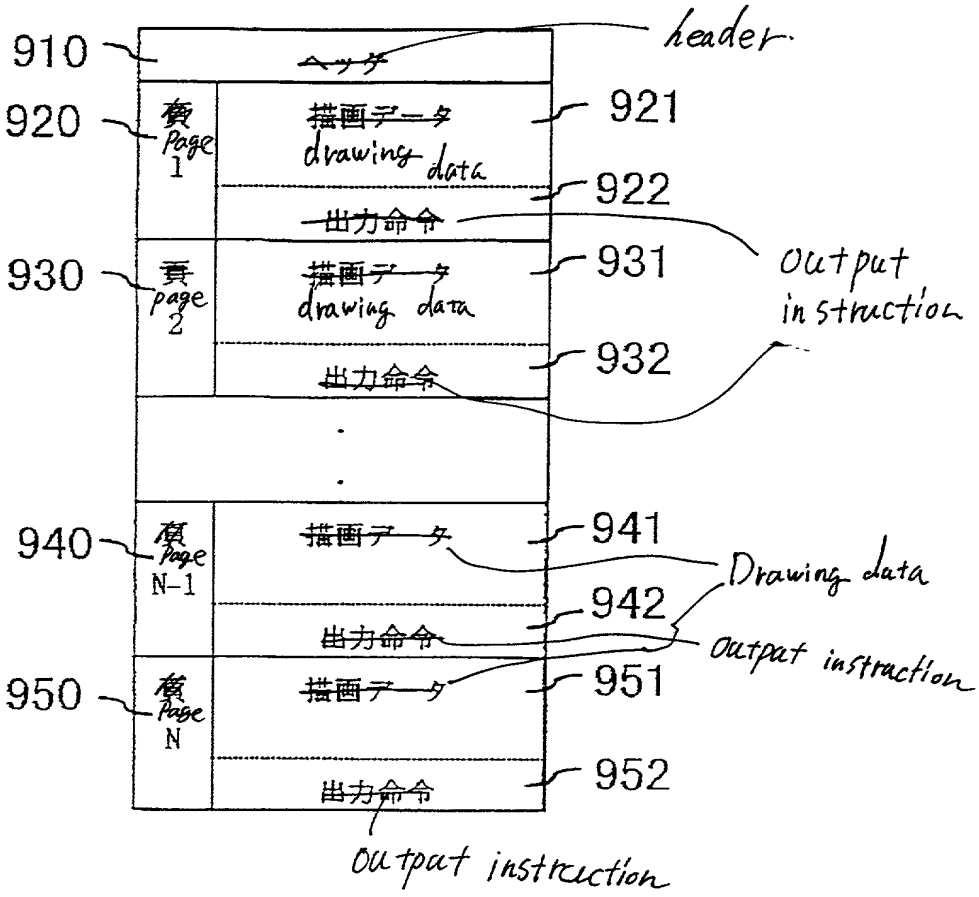

910
ヘッダ
header
920
頁 Page 1
描画データ drawing data
921
922
出力命令
930
頁 page 2
描画データ drawing data
931
932
出力命令
output instruction
940
頁 Page N-1
描画データ
941
Drawing data
942
出力命令
output instruction
950
頁 Page N
描画データ
951
952
出力命令
output instruction

FIG. 8

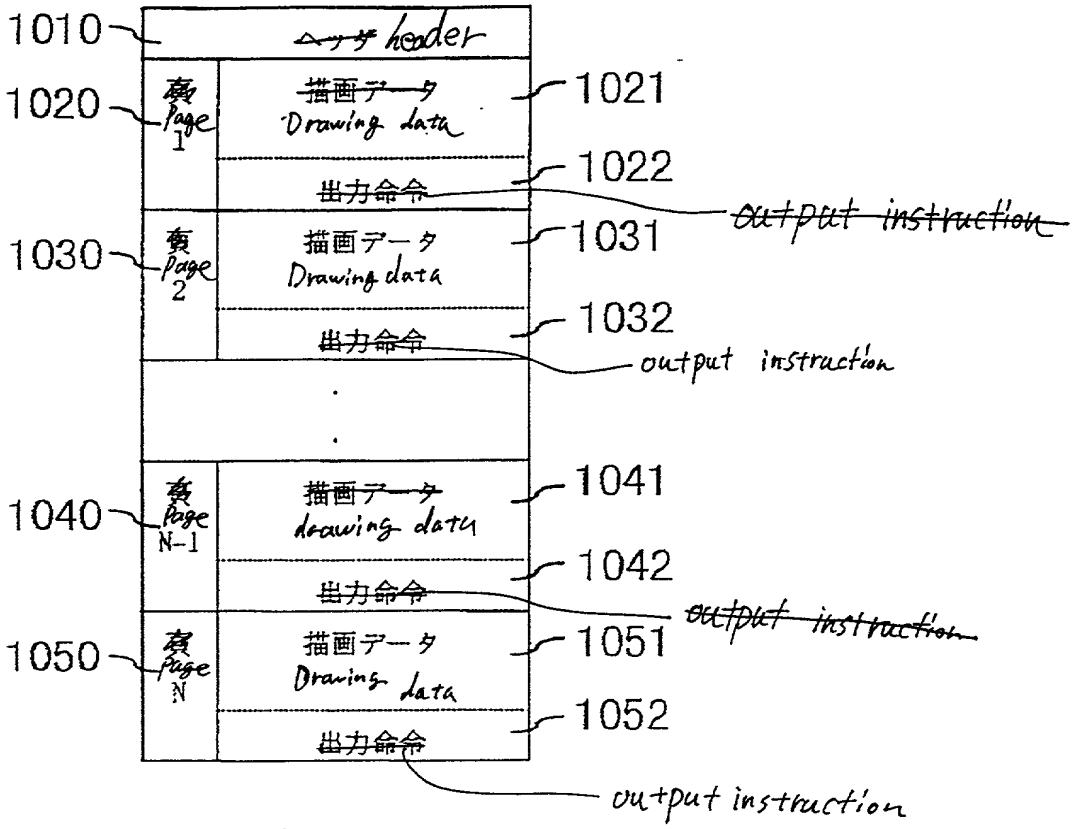
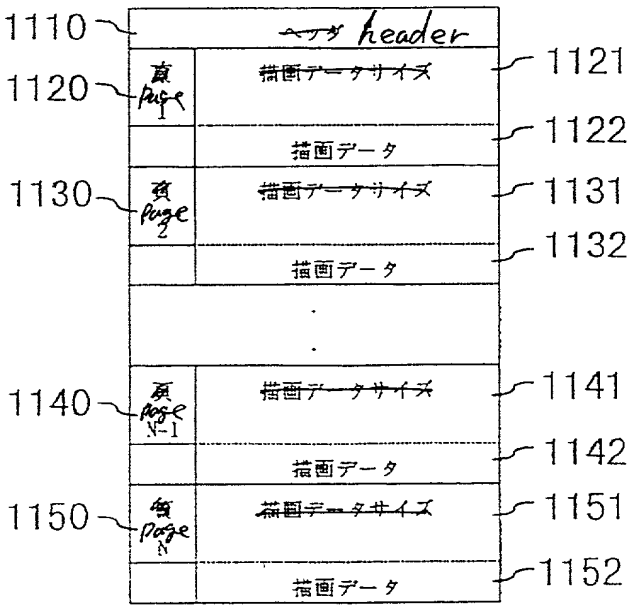


FIG. 9



1121, 1131, 1141 and 1151
↓
drawing data size.

1122, 1132, 1142, 1152
↓
drawing data.

FIG. 10

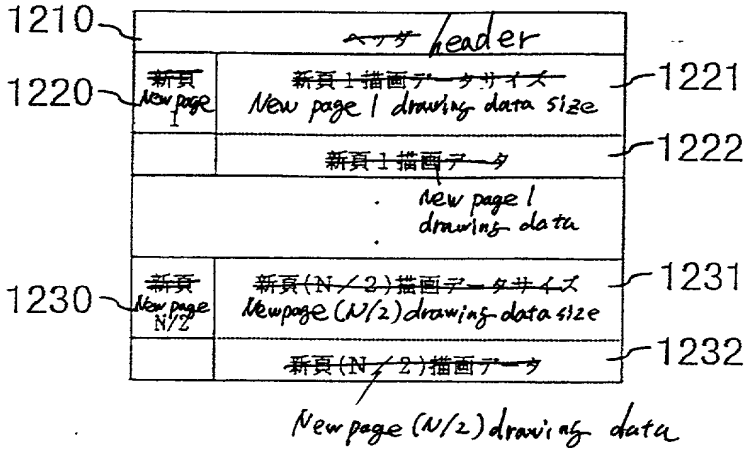

1210
~~ヘッダ~~ header
1220
~~新頁~~ New page 1
~~新頁1描画データサイズ~~ New page 1 drawing data size
1221
~~新頁1描画データ~~
New page 1 drawing data
1222
1230
~~新頁~~ New page N/2
~~新頁(N/2)描画データサイズ~~ Newpage (N/2) drawing data size
1231
~~新頁(N/2)描画データ~~
1232
New page (N/2) drawing data

FIG. 11

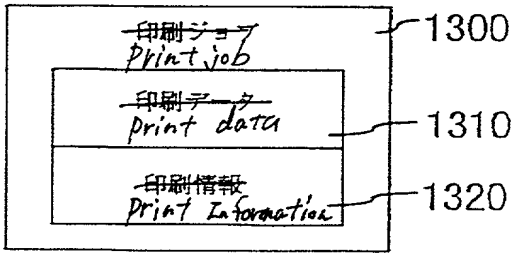

~~印刷ジョブ~~ Print job
1300
~~印刷データ~~ print data
1310
~~印刷情報~~ Print Information
1320

FIG. 12

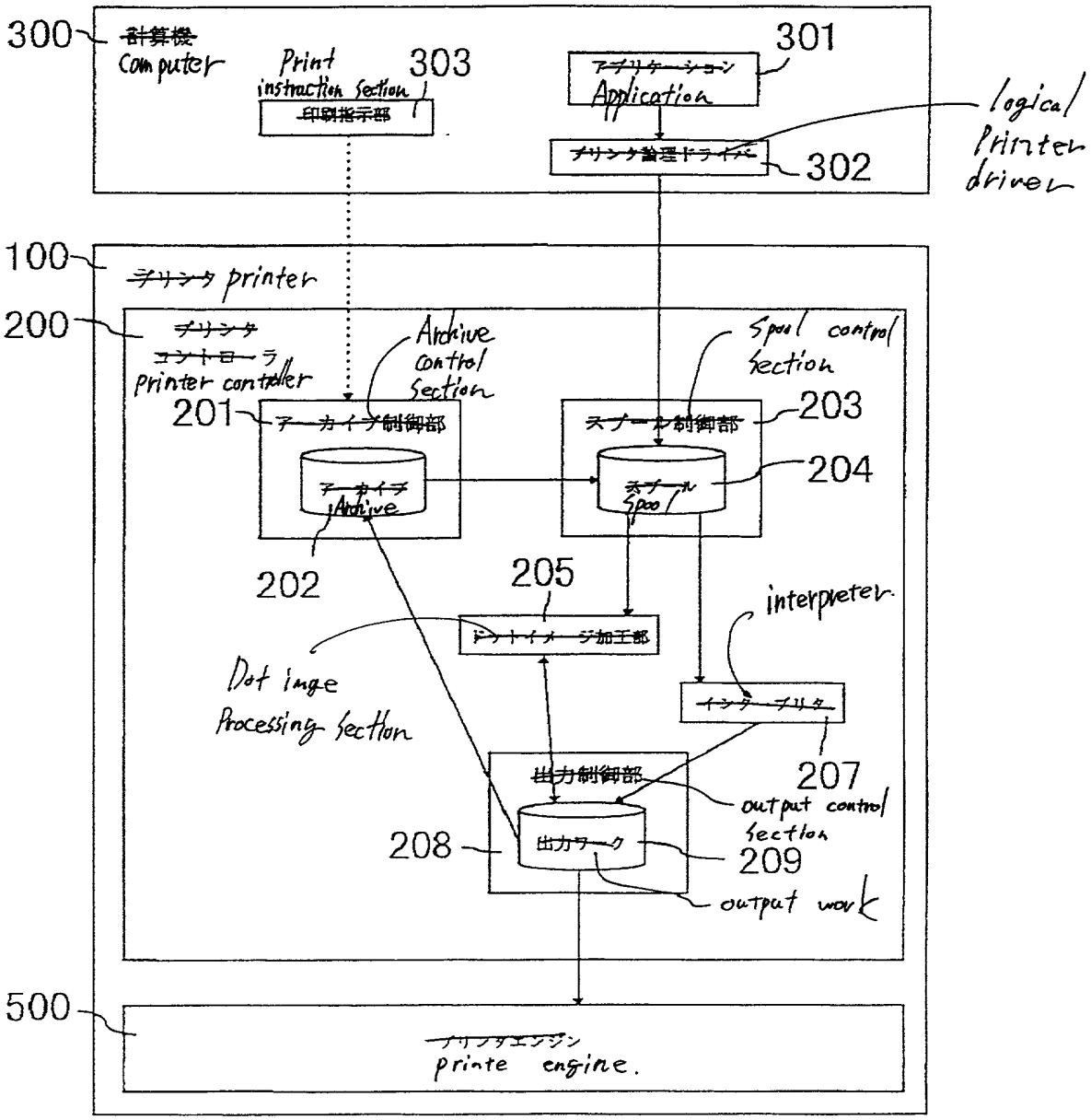

300
計算機
Computer
Print instruction section
印刷指示部
303
301
アプリケーション
Application
logical Printer driver
プリンタ論理ドライバ
302
100
プリンタ printer
200
プリンタ
コントローラ
printer controller
Archive control section
201
アーカイブ制御部
アーカイブ
Archive
202
Spool control section
203
スプール制御部
スプール
Spool
204
205
ドットイメージ加工部
Dot Image Processing Section
interpreter
インタープリタ
207
出力制御部
output control section
208
出力ワーク
209
output work
500
プリンタエンジン
printe engine.

FIG. 13

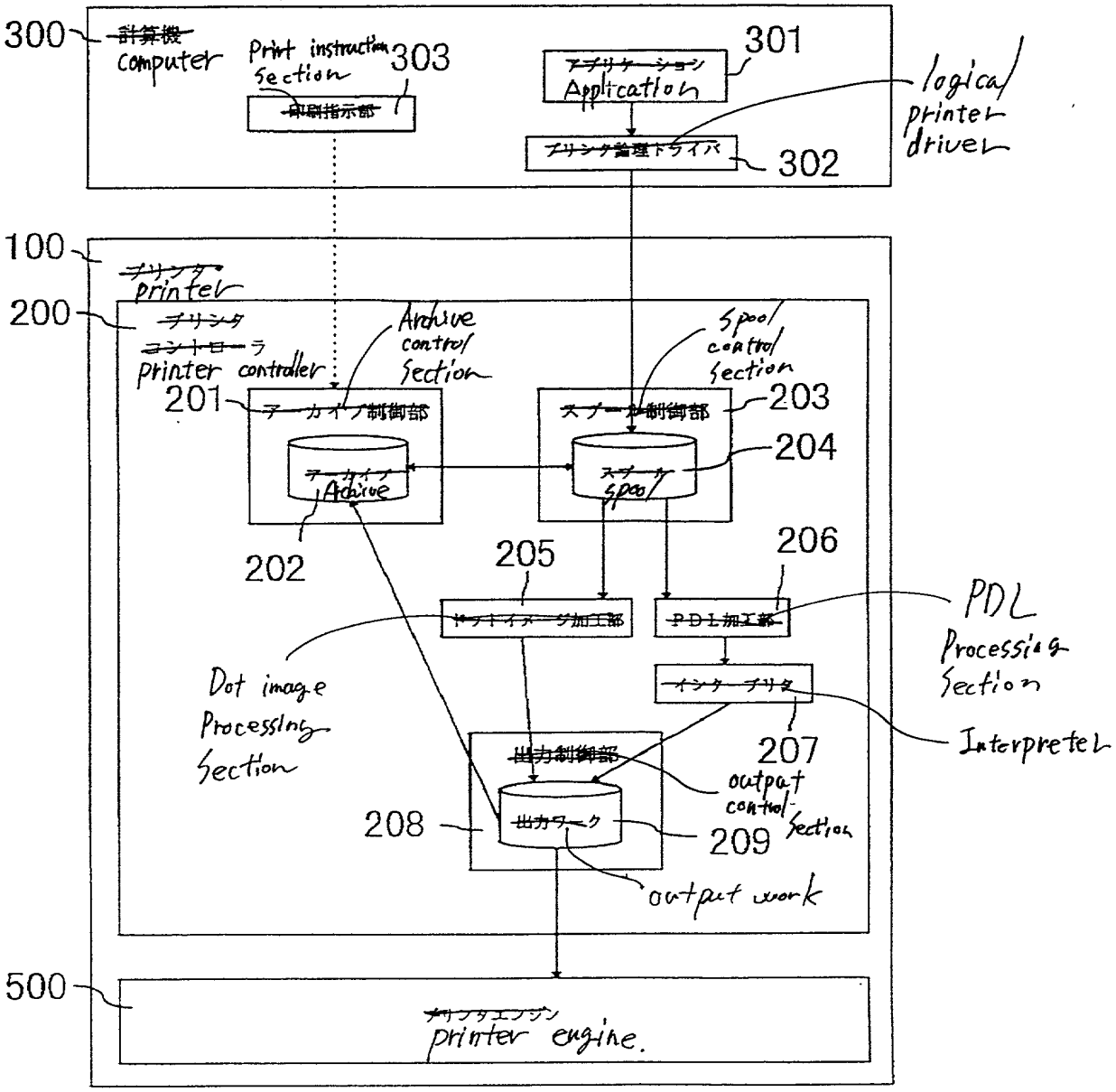

300
計算機
computer
Print instruction section
303
印刷指示部
301
アプリケーション
Application
logical printer driver
プリンタ論理ドライバ
302
100
プリンタ
printer
200
プリンタ
コントローラ
printer controller
Archive control section
Spool control section
201
アーカイブ制御部
203
スプール制御部
204
アーカイブ
Archive
スプール
spool
202
205
206
ラスタイメージ加工部
PDL加工部
PDL Processing Section
Dot image Processing Section
インタープリタ
Interpreter
207
出力制御部
output control section
208
出力ワーク
209
output work
500
プリンタエンジン
printer engine.

FIG. 14

Print Information			Setting Example	
Setting Item	Contents	Value	Contents	Value
1400 Print Mode	Print	1	Print & Storage	Print Mode = 3
	Storage	2		
	Print & Storage	3		
1410 Number of Copies	n	Integer	3 Copies	Copies = 3
1420 Print in Copy Units	Yes	1	Yes	Collate = 1
	No	0		
1430 Paper Thickness	Thin	1	Thin	PaperThick = 1
	Normal	2		
	Thick	3		
	Automatic Selection	0		
1440 Paper Feed Section	Paper Feed Section 1	1	Paper Feed Section 1	InputType = 1
	Paper Feed Section 1	2		
	Automatic Selection	0		
1450 Paper Discharge Section	Paper Discharge Section 1	1	Paper Discharge Section 2	OutputType = 2
	Paper Discharge Section 1	2		
	Automatic Selection	0		
1460 Single Side/Double Side Print	Single Side Print	0	Double Side Print	Duplex = 1
	Double Side Print	1		
1470 Binding Position (Effective on the Double Side Print)	Long-side binding	0	Long-side Binding	Tumble = 0
	Short-side binding	1		
1480 Paper Discharge Offset	Yes	1	Yes	OutputOffset = 1
	No	0		
1490 Staple	None	0	None	Staple = 0
	Upper-left Corner of Paper in Portable Orientation	1		
	Upper-left Corner of Paper in Landscape Orientation	2		
	Two-center Parts	3		
1500 Punch Hole	None	0	2 Holes	Punch = 2
	2 Holes	2		
	3 Holes	3		
1510 Fold	None	0	None	Fold = 2
	Fold in Two	1		
	Fold in Z	2		
1520 Page Assignment	1 UP	1	4UP	AssignPages = 4
	2 UP	2		
	4 UP	4		
	Saddle Stitch	101		
1530 Page Assignment type	Type 1	1	Type 1	AssignType = 1
	Type 2	2		
	Type 3	3		
	Type 4	4		
1540 Print Data Storage Location	File Name		c:¥arc¥file1.ps	

FIG. 15

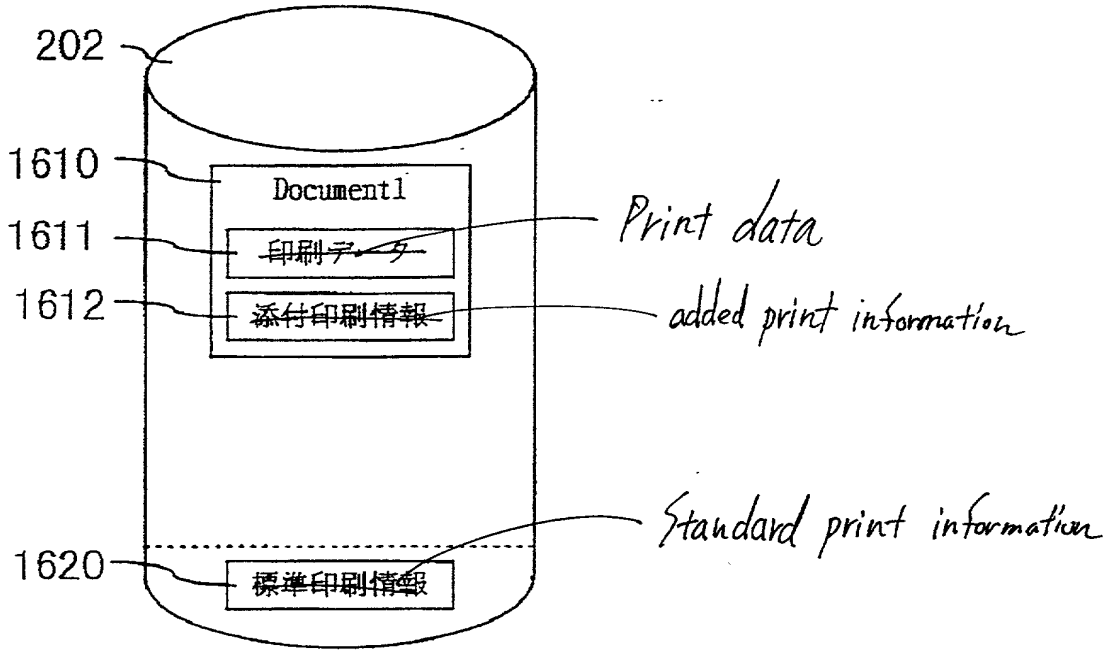

202
1610
Document1
1611
印刷データ
1612
添付印刷情報
1620
標準印刷情報
Print data
added print information
Standard print information

FIG. 16

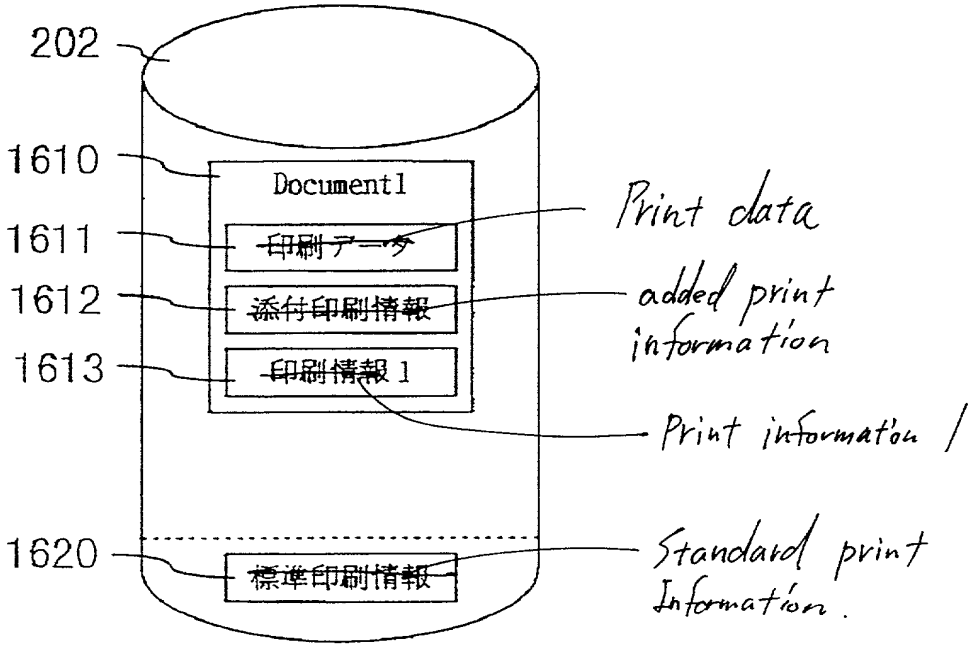

202
1610
Document1
1611
印刷データ
1612
添付印刷情報
1613
印刷情報1
1620
標準印刷情報
Print data
added print information
Print information 1
Standard print Information.

FIG. 17

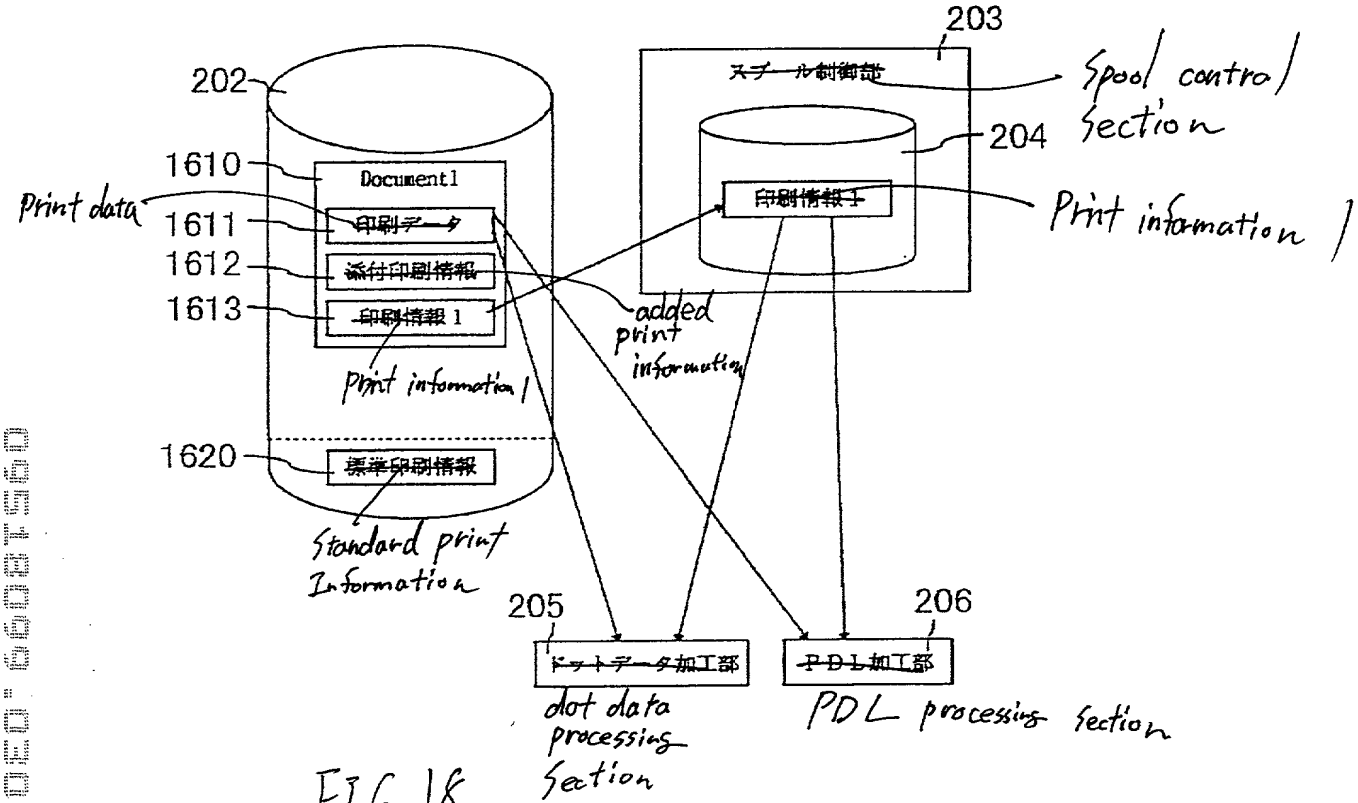

203
202
スプール制御部
Spool control section
204
1610
Document1
Print data
1611
印刷データ
印刷情報1
Print information 1
1612
添付印刷情報
1613
印刷情報1
added print information
Print information 1
1620
標準印刷情報
Standard print Information
205
206
ドットデータ加工部
PDL加工部
dot data processing Section
PDL processing Section

FIG. 18

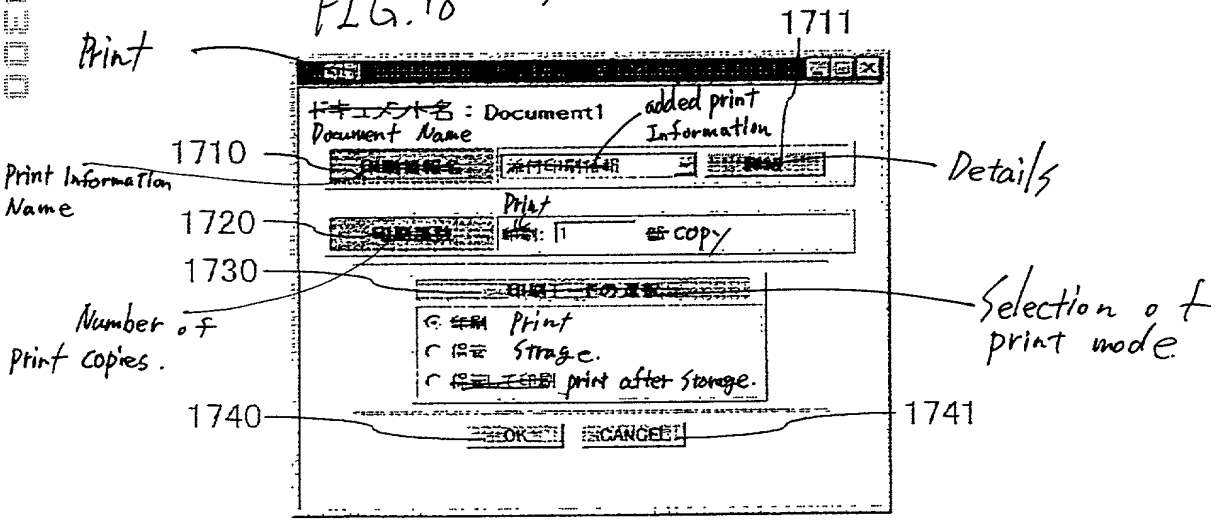

Print
1711
ドキュメント名：Document1
Document Name
added print Information
1710
Print Information Name
Details
Print
1720
部数: 1 copy
1730
Selection of print mode
Print
Storage.
print after Storage.
Number of Print copies.
1740
1741
OK
CANCEL

FIG. 19

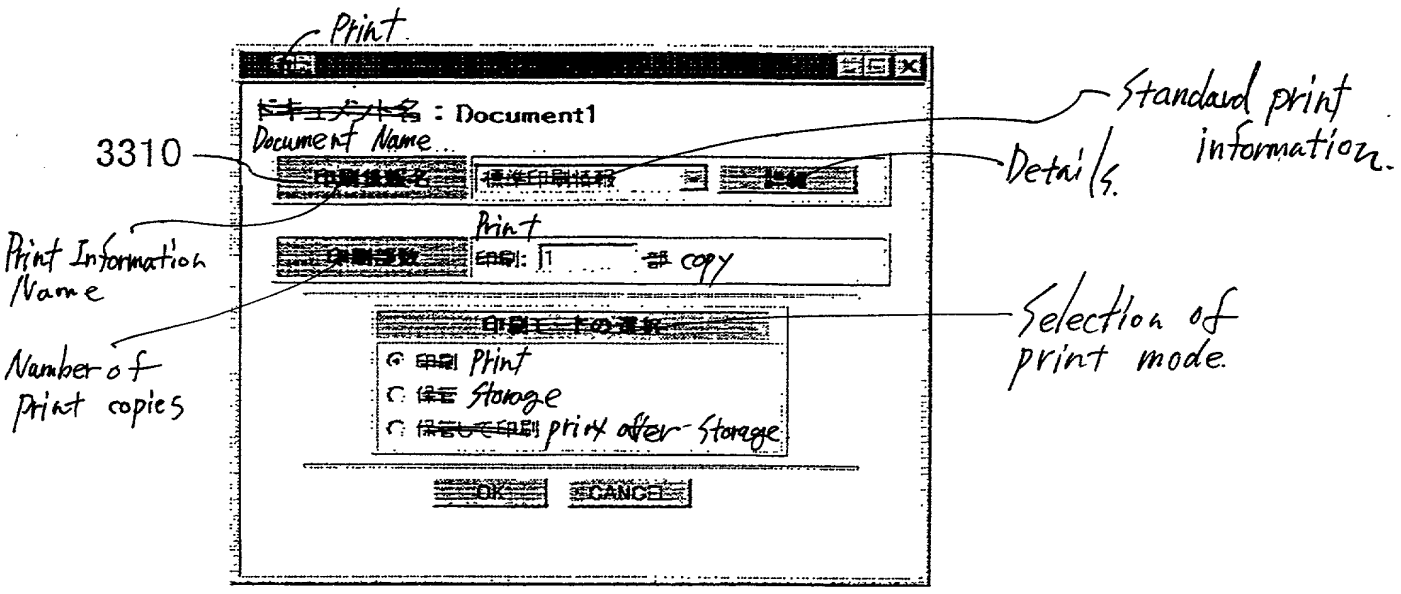

Print
: Document1
Document Name
3310
Standard print information
Details
Print Information Name
Print
copy
Number of Print copies
Selection of print mode
Print
Storage
print after Storage
OK
CANCEL

FIG. 20

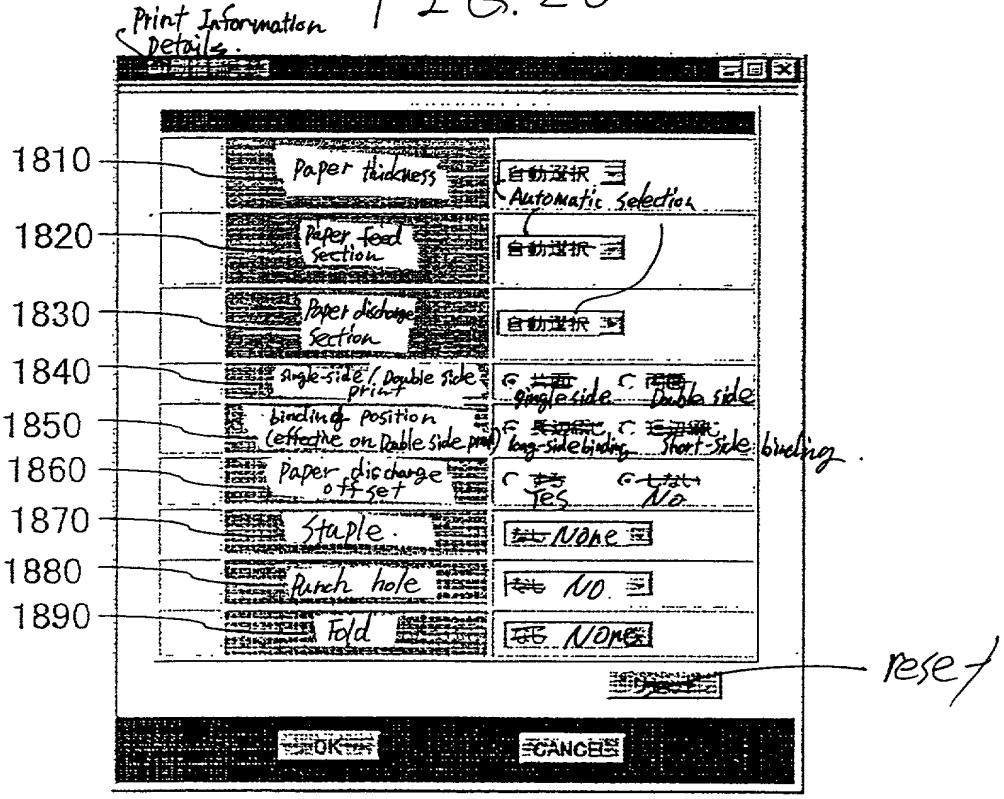

Print Information Details
1810
Paper thickness
Automatic selection
1820
Paper feed section
1830
Paper discharge section
1840
single-side/Double side print
single side
Double side
1850
binding position (effective on Double side print)
long-side binding
short-side binding
1860
Paper discharge offset
Yes
No
1870
Staple
NONE
1880
Punch hole
NO
1890
Fold
NONE
reset
OK
CANCEL

FIG. 21

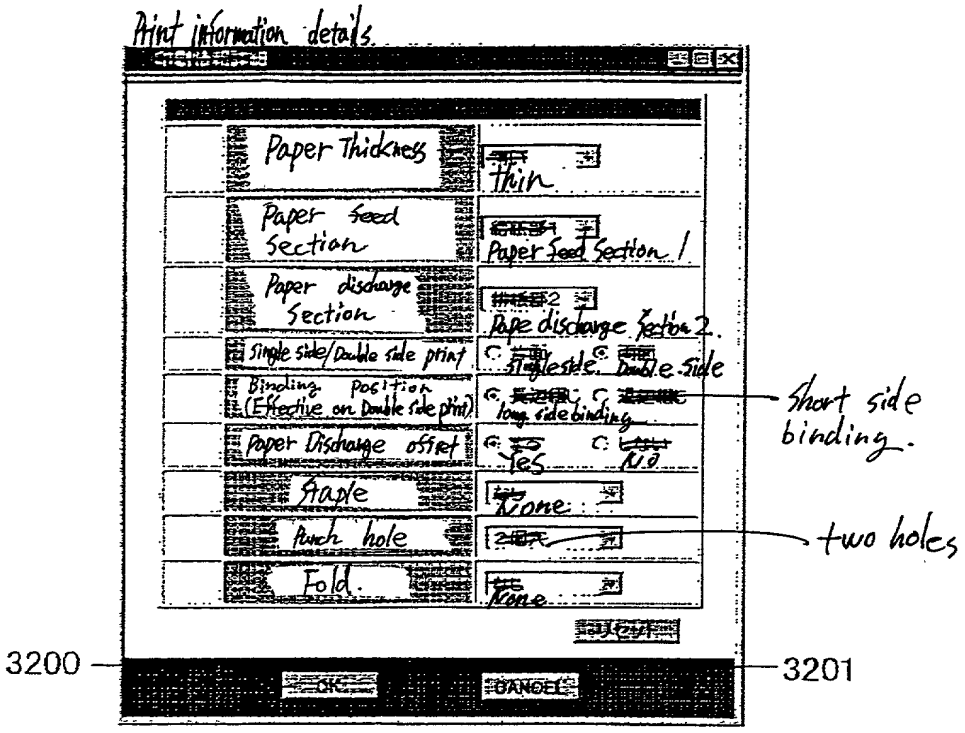

Print information details.
Paper Thickness
Thin
Paper Feed Section
Paper Feed Section 1
Paper discharge Section
Paper discharge Section 2.
Single side/Double side print
Single side. Double side
Binding Position (Effective on Double side print)
long side binding
Short side binding.
Paper Discharge offset
Yes
No
Staple
None
Punch hole
two holes
Fold.
None
OK
CANCEL
3200
3201

FIG. 22

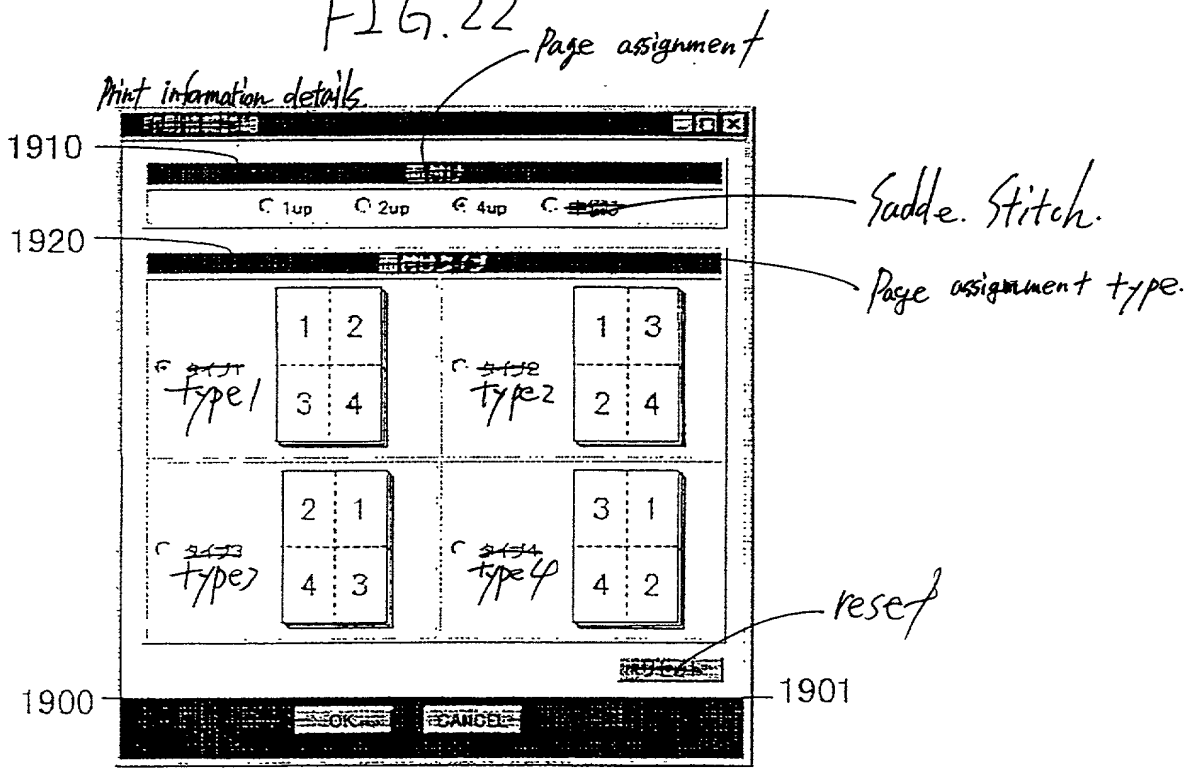

Page assignment
Print information details.
1910
1up
2up
4up
Saddle. Stitch.
1920
Page assignment type.
type1
type2
type3
type4
reset
1900
OK
CANCEL
1901

FIG. 23

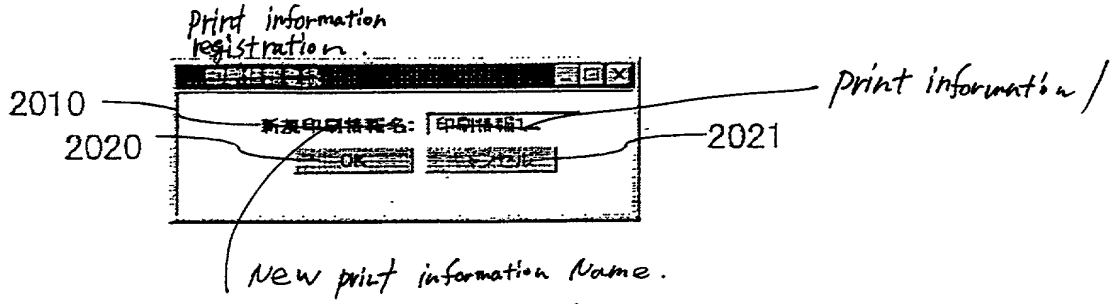


FIG. 24

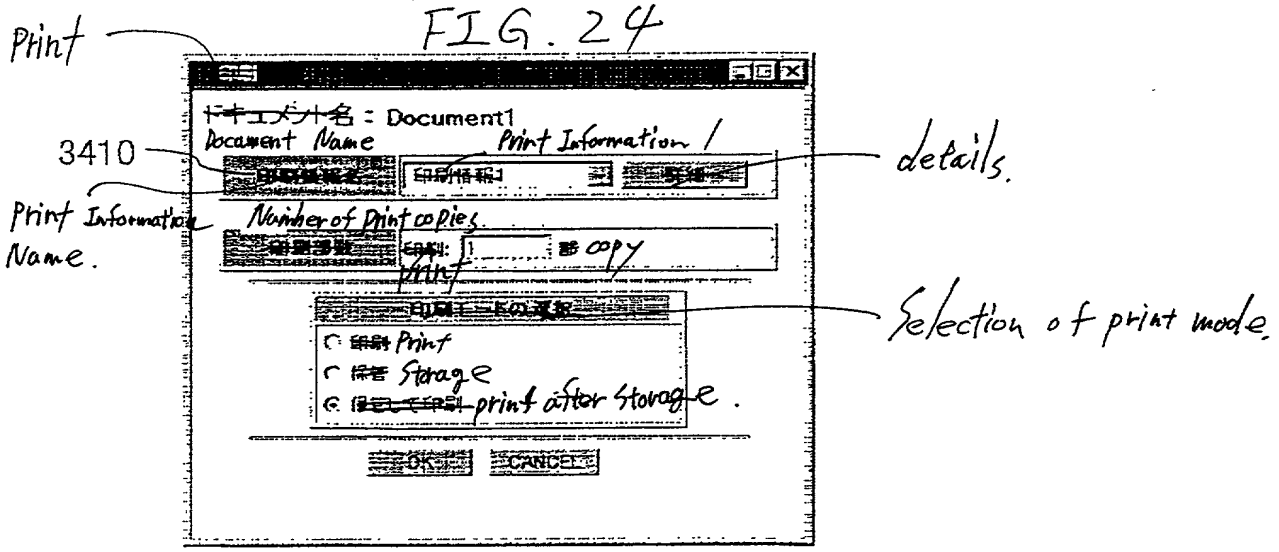


FIG. 25

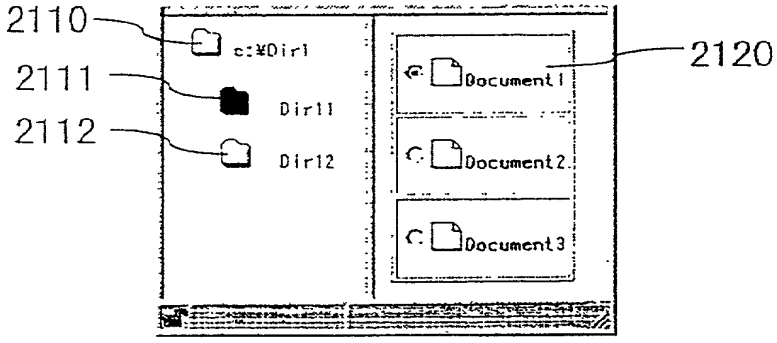


FIG. 26

Print Information			Setting Example	
Setting Item	Contents	Value	Contents	Value
Print Mode	Print	1	Print	Print Mode = 1
	Storage	2		
	Print & Storage	3		
Number of Copies	n	Integer	1 Copy	Copies = 1
Print in Copy Units	Yes	1	Yes	Collate = 1
	No	0		
Paper Thickness	Thin	1	Automatic Selection	PaperThick = 0
	Normal	2		
	Thick	3		
	Automatic Selection	0		
Paper Feed Section	Paper Feed Section 1	1	Automatic Selection	InputType = 0
	Paper Feed Section 1	2		
	Automatic Selection	0		
Paper Discharge Section	Paper Discharge Section 1	1	Automatic Selection	OutputType = 0
	Paper Discharge Section 1	2		
	Automatic Selection	0		
Single Side/Double Side Print	Single Side Print	0	Single Side Print	Duplex = 0
	Double Side Print	1		
Binding Position (Effective on the Double Side Print)	Long-side binding	0	Long-side Binding	Tumble = 0
	Short-side binding	1		
Paper Discharge Offset	Yes	1	No	OutputOffset = 0
	No	0		
Staple	None	0	None	Staple = 0
	Upper-left Corner of Paper in Portable Orientation	1		
	Upper-left Corner of Paper in Landscape Orientation	2		
	Two-center Parts	3		
Punch Hole	None	0	None	Punch = 0
	2 Holes	2		
	3 Holes	3		
Fold	None	0	None	Fold = 0
	Fold in Two	1		
	Fold in Z	2		
Page Assignment	1 UP	1	1UP	AssignPages = 1
	2 UP	2		
	4 UP	4		
	Saddle Stitch	101		
Page Assignment Type	Type 1	1	Type 1	AssignType = 1
	Type 2	2		
	Type 3	3		
	Type 4	4		
Print Data Storage Location	File Name		c:¥arc¥file1.ps	

Declaration and Power of Attorney for Patent Application

特許出願宣言書及び委任状

Japanese Language Declaration

日本語宣言書

下記の氏名の発明者として、私は以下の通り宣言します。

As a below named inventor, I hereby declare that:

私の住所、私書箱、国籍は下記の私の氏名の後に記載された通りです。

My residence, post office address and citizenship are as stated next to my name,

下記の名称の発明に関して請求範囲に記載され、特許出願している発明内容について、私が最初かつ唯一の発明者(下記の氏名が一つの場合)もしくは最初かつ共同発明者であると(下記の名称が複数の場合)信じています。

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

PRINT SYSTEM AND PRINT SYSTEM CONTROL METHOD

上記発明の明細書(下記の欄でX印がついていない場合は、本書に添付)は、

the specification of which is attached hereto unless the following box is checked:

☐ __月__日に提出され、米国出願番号または特許協定条約国際出願番号を _____ とし、

(該当する場合) _____ に訂正されました。

☐ was filed on _____ as United States Application Number or PCT International Application Number

_____ and was amended on

_____ (if applicable).

私は、特許請求範囲を含む上記訂正後の明細書を検討し、内容を理解していることをここに表明します。

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

私は、連邦規則法典第37編第1条56項に定義されるとおり、特許資格の有無について重要な情報を開示する義務があることを認めます。

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

Japanese Language Declaration

(日本語宣言書)

私は、米国法典第35編第119条(a)-(d)項又は第365条(b)項に基き下記の、米国以外の国の少なくとも一カ国を指定している特許協力条約第365条(a)項に基づく国際出願、又は外国での特許出願もしくは発明者証の出願についての外国優先権をここに主張するとともに、優先権を主張している本出願の前に出願された特許または発明者証の外国出願を以下に、枠内をマークすることで、示しています。

I hereby claim foreign priority under Title 35, United States Code, Section 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed.

Prior Foreign Applications 外国での先行出願			Priority Not Claimed 優先権主張なし
P. Hei. 11-056648 / (Number) (番号)	Japan (Country) (国名)	04/March/1999 (Day/Month/Year Filed) (出願年月日)	☐
P. Hei. 11-358894 (Number) (番号)	Japan (Country) (国名)	17/December/1999 (Day/Month/Year Filed) (出願年月日)	☐
(Number) (番号)	(Country) (国名)	(Day/Month/Year Filed) (出願年月日)	☐

私は、第35編米国法典119条(e)項に基づいて下記の米国特許出願規定に記載された権利をここに主張致します。

I hereby claim the benefit under Title 35, United States Code, Section 119(e) of any United States provisional application(s) listed below.

(Application No.) (出願番号)	(Filing Date) (出願日)	(Application No.) (出願番号)	(Filing Date) (出願日)

私は、下記の米国法典第35編第120条に基づいて下記の米国特許出願に記載された権利、又は米国を指定している特許協力条約第365条(c)に基づく権利をここに主張します。又、本出願の各請求範囲の内容が米国法典第35編第112条第1項又は特許協力条約で規定された方法で先行する米国特許出願に開示されていない限り、その先行米国出願書提出日以降で本出願書の日本国内又は特許協力条約国際出願提出日までの期間中に入手された、連邦規則法典第37編第1条第56項で定義された特許資格の有無に関する重要な情報について開示義務があることを認識しています。

I hereby claim the benefit of Title 35, United States Code Section 120 of any United States application(s), or 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of Title 35, United States Code Section 112, I acknowledge the duty to disclose any material information which is material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application:

(Application No.) (出願番号)	(Filing Date) (出願日)	(Status: Patented, Pending, Abandoned) (現況: 特許許可済、係属中、放棄済)
(Application No.) (出願番号)	(Filing Date) (出願日)	(Status: Patented, Pending, Abandoned) (現況: 特許許可済、係属中、放棄済)

私は、私自身の知識に基づいて本宣言中で私が行う表明が真実であり、かつ私の入手した情報と私の信ずるところに基づく表明が全て真実であると信じていること、さらに故意になされた虚偽の表明及びそれと同等の行為は米国法典第18編第1001条に基づき、罰金または拘禁、もしくはその両方により処罰されること、そしてそのような故意による虚偽の声明を行えば、出願した、又は既に許可された特許の有効性が失われることを認識し、よってここに上記のごとく宣誓を致します。

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Japanese Language Declaration

(日本語宣言書)

委任状：私は、下記の発明者として、本出願に関する一切の手続きを米国特許商標局に対して遂行する弁理士又は代理人として、下記のものを指名致します。(弁護士、又は代理人の氏名及び登録番号を明記のこと)

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith *(list name and registration number)*

John H. Mion, Reg. No. 18,879; Thomas J. Macpeak, Reg. No. 19,292; Robert J. Seas, Jr., Reg. No. 21,092; Darryl Mexic, Reg. No. 23,063; Robert V. Sloan, Reg. No. 22,775; Peter D. Olexy, Reg. No. 24,513; J. Frank Osha, Reg. No. 24,625; Waddell A. Biggart, Reg. No. 24,861; Louis Gubinsky, Reg. No. 24,835; Neil B. Siegel, Reg. No. 25,200; David J. Cushing, Reg. No. 28,703; John R. Inge, Reg. No. 26,916; Joseph J. Ruch, Jr., Reg. No. 26,577; Sheldon I. Landsman, Reg. No. 25,430; Richard C. Turner, Reg. No. 29,710; Howard L. Bernstein, Reg. No. 25,665; Alan J. Kasper, Reg. No. 25,426; Kenneth J. Burchfiel, Reg. No. 31,333; Gordon Kit, Reg. No. 30,764; Susan J. Mack, Reg. No. 30,951; Frank L. Bernstein, Reg. No. 31,484; Mark Boland, Reg. No. 32,197; William H. Mandir, Reg. No. 32,156; Scott M. Daniels, Reg. No. 32,562; Brian W. Hannon, Reg. No. 32,778; Abraham J. Rosner, Reg. No. 33,276; Bruce E. Kramer, Reg. No. 33,725; Paul F. Neils, Reg. No. 33,102; Brett S. Sylvester, Reg. No. 32,765 and Robert M. Masters, Reg. No. 35,603

書類送付先：

Send Correspondence to:

SUGHRUE, MION, ZINN, MACPEAK & SEAS, PLLC
2100 Pennsylvania Avenue, N.W., Washington, D.C. 20037-3202

直通電話連絡先：(名称及び電話番号)

Direct Telephone Calls to: *(name and telephone number)*

(202)293-7060

唯一又は第一発明者名	Full name of sole or first inventor Tatsuro AKABANE
発明者の署名 日付	Inventor's signature Date Tatsuro Akabane February 27, 2000
住所	Residence Ibaraki, Japan
国籍	Citizenship Japan
郵便の宛先	Post office address c/o Hitachi Koki Co., Ltd., 1060,
	Takeda, Hitachinaka-shi, Ibaraki, Japan
第二共同発明者名(該当する場合)	Full name of second joint inventor, if any Seiji KAGEYAMA
第二発明者の署名 日付	Second inventor's signature Date Seiji Kageyama February 27, 2000
住所	Residence Ibaraki, Japan
国籍	Citizenship Japan
郵便の宛先	Post office address c/o Hitachi Koki Co., Ltd., 1060,
	Takeda, Hitachinaka-shi, Ibaraki, Japan

(第三以降の共同発明者についても同様に記載し、署名をすること。)

(Supply similar information and signature for third and subsequent joint inventors.)

Japanese Language Declaration
(日本語宣言書)

第三共同発明者名（該当する場合）	Full name of third joint inventor, if any Katsumi KUMAGAI
第三発明者の署名 日付	Third inventor's signature Date Katsumi Kumagai February 27, 2000
住所	Residence Ibaraki, Japan
国籍	Citizenship Japan
郵便の宛先	Post office address c/o Hitachi Koki Co., Ltd., 1060,
	Takeda, Hitachinaka-shi, Ibaraki, Japan
第四共同発明者名（該当する場合）	Full name of fourth joint inventor, if any Masamitsu SUZUKI
第四発明者の署名 日付	Fourth inventor's signature Date Masamitsu Suzuki February 27, 2000
住所	Residence Ibaraki, Japan
国籍	Citizenship Japan
郵便の宛先	Post office address c/o Hitachi Koki Co., Ltd., 1060,
	Takeda, Hitachinaka-shi, Ibaraki, Japan
第五共同発明者名（該当する場合）	Full name of fifth joint inventor, if any
第五発明者の署名 日付	Fifth inventor's signature Date
住所	Residence
国籍	Citizenship
郵便の宛先	Post office address
第六共同発明者名（該当する場合）	Full name of sixth joint inventor, if any
第六発明者の署名 日付	Sixth inventor's signature Date
住所	Residence
国籍	Citizenship
郵便の宛先	Post office address